

A ARJUN GOPAL AND OTHERS

v.

UNION OF INDIA AND OTHERS

(IA Nos. 6 and 8 of 2016, IA Nos. 10, 11, 80176, 96202, 109668,
B 109720 and 122778 of 2017, IA Nos. 68888 and 68897 of 2018)

in

(Writ Petition (Civil) No. 728 of 2015)

OCTOBER 23, 2018

C **[A.K. SIKRI AND ASHOK BHUSHAN, JJ.]**

Environment – Air Pollution – Petitioners prayed for directions to the respondents to take possible measures for checking the pollution by striking at the causes of the pollution, which included banning the use of firecrackers, sparkles and minor explosives, in any form, during festivals or otherwise – The following specific directions were issued: (1) Crackers with reduced emission (improved crackers) and green crackers only would be permitted to be manufactured and sold; (2) Production and sale of other crackers is hereby banned; (3) Manufacture, sale and use of joined firecrackers (series crackers or laris) is hereby banned; (4) Sale shall only be through licensed traders; (5) no e-commerce websites, including flipkart, amazon etc., shall accept any online orders and effect online sales; (6) barium salts in the fireworks is also hereby banned; (7) Petroleum and Explosives Safety Organisation (PESO) is directed to review the clinical composition of fireworks, particularly reducing aluminum content – For undertaking this exercise, PESO would also associate Fireworks Research and Development Centre (FRDC); (8) even those crackers which have already been produced and they do not fulfill the reduced emission firecrackers conditions will not be allowed to be sold in Delhi and NCR; (9) PESO will ensure fireworks with permitted chemicals only to be purchased/possessed/sold/used during Diwali and all other religious festivals, of any religion whatsoever, and other occasions like marriages, etc – It shall test and check for the presence of banned chemicals like Lithium/Arsenic/ Antimony/Lead/Mercury; (10) PESO will ensure suspension of the licenses of manufacturers of such fireworks items and appropriate disposal of such stock;

(11) PESO will ensure that only those crackers whose decibel (sound) level are within the limits are allowed in the market and will ensure to take action by suspending the licenses of the manufacturers on such violations and disposal of such lots; (12) Extensive public awareness campaigns shall be taken up by the Central Government/ State Governments/Schools/ Colleges informing the public about the harmful effects of firecrackers; (13) On Diwali days or on any other festivals like Gurpurab etc., when such fireworks generally take place, it would strictly be from 8:00 p.m. till 10:00 p.m. only – On Christmas eve and New Year eve, when such fireworks start around midnight, i.e. 12:00 a.m., it would be from 11:55 p.m. till 12:30 a.m. only; (14) The Union of India, Government of NCT of Delhi and the State Governments of the NCR would permit community firecracking only for Diwali and some other festivals, wherever it can be done – Even for marriages and other occasions, sale of only improved crackers and green crackers is permitted – Insofar as other States are concerned, an endeavour shall be made by them also to explore the feasibility of community firecracking; (15) All the official respondents, and particularly the Police, shall ensure that fireworks take place only during the designated time and at designated places, as mentioned above – They shall also ensure that there is no sale of banned firecrackers; (16) Central Pollution Control Board (CPCB) and respective State Pollution Control Boards/ Pollution Control Committees (SPCBs/PCCs) of the States and Union Territories shall carry out short-term monitoring in their cities for 14 days (commencing from 7 days prior to Diwali and ending 7 days after Diwali) for the parameters namely, Aluminum, Barium, Iron apart from the regulatory parameters against the short-term Ambient Air Quality Criteria Values (AAQCVs) proposed by CPCB with regard to bursting of firecrackers.

Vellore Citizens' Welfare Forum v. Union of India and Others (1996) 5 SCC 647 : [1996] 5 Suppl. SCR 241 ; *A.P. Pollution Control Board v. Prof. M.V. Nayudu (Retd.) and Others* (1999) 2 SCC 718 : [1999] 1 SCR 235 ; *Noise Pollution (V), in Re* (2005) 5 SCC 733 : [2005] 1 Suppl. SCR 624 ; *Shivashakti Sugars Limited v. Shree Renuka Sugar Limited and Others* (2017) 7 SCC 729 – referred to.

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Case Law Reference

[1996] 5 Suppl. SCR 241 referred to Para 17

[1999] 1 SCR 235 referred to Para 17

[2005] 1 Suppl. SCR 624 referred to Para 17

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(2017) 7 SCC 729 referred to Para 37

CIVIL ORIGINAL JURISDICTION : IA Nos. 6 and 8 of 2016, IA Nos. 10, 11, 80176, 96202, 109668, 109720 and 122778 of 2017, IA Nos. 68888 and 68897 of 2018 in Writ Petition (Civil) No.728 of 2015

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Under Article 32 of the Constitution of India

WITH

Writ Petition (Civil) Nos. 891, 895, 899 of 2016 and 213 of 2017.

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A. N. S. Nadkarni, ASG, Anil Grover, AAG, Ms. Vibha Dutta Makhija, Shekhar Naphade, Dhruv Mehta, Ajit Kumar Sinha, Sr. Advs., Gopal Sankaranarayanan, Ms. Pooja Dhar, Amit Bhandari, Ms. Haripriya Padmanabhan, Ms. Shery Patnaik, Ms. Ashiwariy Kane, Ms. Veera Mahuli, Ms. Astha Sharma, Anubhav Kumar, Abhishek Swarup, Ankit Agarwal, Ms. Disha Vaish, Vinodh Kanna B., A. Sriram, Abhikalp Pratap

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Handoo, Bijender Singh Chaudhary, Hitesh Kumar Sharma, S. K. Rajora, Vijay Partap Singh, Dr. Kailash Chand, Ms. Garima Bajaj, Ms. Aakash Kaul, M. A. Chinnasamy, Ms. C. Rubavathi, P. Raja Ram, S. Peer Mohamad, V. Senthil Kumar, Ms. Supriya Juneja, Ms. Adihja Singla, Bharat Monga, Ms. M. K. Aswahi, S. Manoj Selyaraj, Dr. Arvind Kumar,

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Ms. Nancy Mittal, Ashok Kumar Gupta II, Suvidutt M. S., Mohinder Jit Singh, S. K. Verma, Yugandhara Pawar Jha, Ms. Uttara Babbar, Ms. Bhavana Duhoon, Ms. Deboshree Kukherjee, Shyam Kumar, Sanjay Kumar Visen, D. N. Goburdhun, W. A. Qadri, M. P. Gupta, Ms. Pallavi Chopra, G. S. Makker, Ms. Pallavi C., Baijnath Patel, Ritesh Kumar, Ms. Suhasini Sen, Ms. Kiran Bhardwaj, B. V. Balaram Das,

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M. Yoesh Kanna, Ms. Sujatha Bagadhi, S. Partha Sarathi, Aviral Saxena, Sandeep Singh, Sanjay Kumar Tyagi, J. Sai Deepak, Vinesh K. Sharma, Ashutosh Nagar, Pradeep Misra, Daleep Dhyani, Suraj Singh, Chandan Kumar, Gaurang Kanth, Ms. Vandana Sehgal, Advs. for the appearing parties. A

Applicant-in-person. B

The Judgment of the Court was delivered by

A. K. SIKRI, J. Writ Petition (Civil) No. 728 of 2015 was filed on September 24, 2015 on behalf of three infants, who are made petitioners in this writ petition. Petitioner No.1 and 2, on the date of filing of this writ petition, were six months old and petitioner No.3 was fourteen months old. This petition has been filed through their next friends, i.e. their fathers, who are concerned about the health of their children as they feel that due to the alarming degradation of the air quality, leading to severe air pollution in the city of Delhi (where these petitioners reside), the petitioners may encounter various health hazards. Poor, very poor or severe air quality/air pollution affects all citizens, irrespective of their age. However, claim the petitioners, children are much more vulnerable to air pollutants as exposure thereto may affect them in various ways, including aggravation of asthma, coughing, bronchitis, retarded nervous system breakdown and even cognitive impairment. The petition accepts that there are number of reasons which have contributed to poor air quality in Delhi and National Capital Region (for short, 'NCR'). At the same time, it is emphasised that air pollution hits its nadir during *Diwali* time because of indiscriminate use of firecrackers, the chemical composition whereof increases harmful particulate matters such as PM_{2.5} or PM₁₀ at alarming level thereby bringing the situation of 'emergency'. The petitioners have, thus, prayed for direction to the official respondents to take possible measures for checking the pollution by striking at the causes of the pollution, which includes seasonal crop burning, indiscriminate dumping of dust/*malba* and other pollutants, etc. The prayer also includes banning the use, in any form, of firecrackers, sparkles and minor explosives, in any form, during festivals or otherwise. C
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2. This petition came up for preliminary hearing on October 08, 2015 when notice was issued and the matter was directed to be listed on

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A October 16, 2015 at 2:00 p.m. since the petitioners wanted stay on burning of crackers during Diwali, which was around the corner in that year. When the matter was taken up on October 16, 2015, certain suggestions were made by the learned counsel appearing for the petitioners, which were as under:

- B “1. Restrict licenses to low hazard fireworks.
2. Period of grant of license is too early – need not be from 2 days prior to Dussehra.
3. Restrict window for use of fireworks to be from 7:00 p.m. to 9:00 p.m.
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4. RWAs to hold community fireworks for a brief period of 30 minutes on a single day.
5. Government be directed to give wide publicity to the ill effects of fireworks and encourage restraint on responsible use.
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6. Encourage teachers to tell students not to buy and use fireworks.”

3. Suggestion Nos. 5 and 6 were accepted and the relevant portion of the order that was passed reads as under:

E “In our view for the present, if we accept suggestion Nos. 5 and 6 it will not in any way affect the interest of the respondents.

F Shri Ranjit Kumar, learned Solicitor General appearing for the Union of India states that the Union Government has already taken enough and effective steps to give wide publicity to the ill effects of fireworks.

In spite of the submission so made by the learned Solicitor General, we intend to pass the following order:

G “The Union Government and all the State Governments will give wide publicity both in print and Electronic media to the ill effects of fireworks and advise people accordingly.

H We also direct the Teachers/Lecturers/Assistant Professors/ Professors of the Schools and Colleges to educate the students about the ill effects of the fireworks.””

4. Thereafter, this petition was taken up along with certain other connected petitions, including Writ Petition (Civil) No. 13029 of 1985 titled '*M.C. Mehta v. Union of India*' and orders dated December 16, 2015 were passed issuing several directions with a view to reducing the levels of air pollution within the NCR, as the issues in those writ petitions pertained to air pollution in Delhi and NCR as well. It may be mentioned that the directions issued therein were general in nature though concerning the problem of air pollution. Thereafter also the instant writ petition, along with the *M.C. Mehta* case and other cases, came up for hearing and it is not necessary to take note of all those orders.

5. Pertinently, during *Diwali* of 2016, which was celebrated on October 30, 2016, the air quality in Delhi and NCR worsened alarmingly. In fact, certain reports indicated that the air quality standards in early November of that year were the worst in the world. This prompted the Court to take up IA No.4 filed in this writ petition. After hearing the parties, it passed orders dated November 11, 2016.

6. The petitioners had pressed for interim relief in respect of fireworks, drawing the attention of this Court to the emergent situation that has resulted in worsening the air quality standards in Delhi and National Capital Region (NCR) because of extensive use of fireworks, including firecrackers during *Diwali* last year. It was pointed out that onset of winter itself deteriorates air quality in this region and it gets aggravated because of festival/marriage season that occurs during these very months. Taking note of the aforesaid factors, particularly impact of fireworks on the ambient air and unhealthy effects thereof which had created unprecedented situation in Delhi, with air pollution going up at alarming levels and making it the most polluted city in the world, the order dated November 11, 2016 was passed. Air pollution had gone up to 29 times above the World Health Organisation (WHO) standards. In the aforesaid scenario, this Court deemed it proper to pass certain directions vide its order dated November 11, 2016 in IA No.4. Snapping the supply chain of fireworks was considered to be the more practical way of addressing the menace instead of banning the burning the crackers by individuals as it would have been difficult to monitor and enforce the burning of the crackers by the citizenry.

7. In paragraph 18 of the Order dated November 11, 2016 it was clarified that much was left to be heard, discussed and said about the rival claims and contentions. However, the Court hastened to add that

A harmful effects of fireworks on the ambient air and the lungs, eyes and ears of people was also an acknowledged fact, as can be seen from the following portion of the said paragraph:

B “18. We are aware that we are only issuing interim directions, and much is left to be heard, discussed and said about the rival claims and contentions. What is however indisputable is that the harmful effects of fireworks on the ambient air and the lungs, eyes and ears of people. What is also obvious is the extreme nuisance, noise the fireworks cause to citizens particularly the ailing and the aged. Therefore, though much can be argued as always about the significance and even joy of bursting fireworks, but at the same time (*sic*), prima facie, a just constitutional balance must overwhelmingly prioritize the harmful effects of this hazardous air on present and future generations, irreversible and imperceptible as they are, over the immediate commercial constraints of the manufacturers and suppliers of fireworks...”

D 8. In the process, this Court also recognised the duty of the State to ensure a healthy environment in terms of Article 48A of the Constitution of India as well as the duty of the citizens to ensure the same under Article 51A(g) of the Constitution. The Court also reminded itself of the “precautionary principle” which mandates that where there are threats of serious and irreversible damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the order the Court had taken note of the deleterious effects of air pollution on the health of the people, particularly the children. Going by all these considerations, the Court passed the following directions:

F “19. We thus consider it inappropriate that explosives which are used as fireworks should be available in the market in the NCR till further orders. The mechanism of the law in this regard is clear. Rule 118 of the Explosive Rules, 2008, framed under the Explosives Act, 1884, provides for the manner in which licenses issued under the Explosives Act to store and sell explosives could be suspended or cancelled. Sub-Rule (5) thereof specifically confers on the Central Government a power to suspend or cancel a license if it considers that it is in public interest. This provision also makes it clear that an opportunity to hear the licensee could

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be dispensed with if the Central Government considers that in public interest. This Court finds that the grave air quality situation in NCR is one such case, where this Court, can intervene and suspend the licenses to store and sell fireworks in the NCR. We direct the Central Government to:

- (i) Suspend all such licenses as permit sale of fireworks, wholesale and retail within the territory of NCR.
- (ii) The suspension shall remain in force till further orders of this Court.
- (iii) No such licenses shall be granted or renewed till further orders.

20. In addition to the above, we direct the CPCB to study and prepare a report on the harmful effects of the materials which are currently being used in the manufacture of fireworks. The report shall be submitted within a period of three months to this Court.”

9. Since direction was given to the Central Pollution Control Board (CPCB) to study and prepare a report of the harmful effects of the materials which are currently being used in the manufacture of fireworks and submit a report within three months, the matter was taken up for consideration thereafter from time to time.

10. Thereafter, the manufacturers of firecrackers as well as license holders also filed applications for modification of the aforesaid interim order. It included IA No. 52448 of 2017. Because of these applications, the matter was heard by a Bench of this Court and orders dated September 12, 2017 were passed in the aforesaid IA. In this order also, the Court recognised severity of air pollution in Delhi and NCR. The Court also discussed the manner in which air quality had worsened due to fireworks during *Diwali* days in the year 2016. The Court took note of the steps that were taken by different authorities aiming to reduce air pollution after the passing of orders dated November 11, 2016; the legal provisions contained in the Explosives Act, 1884 and the Explosive Rules, 2008 framed thereunder; and further steps which were needed in this behalf to reduce the pollution in Delhi and NCR. The Court took note of the fact that number of measures were required to be taken for improving air quality as various factors were contributing to the air pollution. It also

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A specifically mentioned that one of the reasons was burning of crackers/
fireworks during *Diwali*. On that basis, the Court also accepted that
one of the possible methods for reducing it during *Diwali* is by continuing
the suspension of licenses for the sale of fireworks, thereby implicitly
prohibiting the bursting of fireworks. However, at the same time, the
B Court expressed the opinion that continuing the suspension of licenses
might be too radical a step to take for the present. It was deemed
appropriate to adopt a graded and balanced approach, which is necessary,
that will reduce and gradually eliminate air pollution in Delhi and in the
NCR caused by the bursting of fireworks. In the process, the Court took
into consideration the interest of those who had already been granted a
C valid permanent licence to possess and sell fireworks in Delhi and the
NCR. We would like to reproduce the following paragraphs from the
said order:

D “67. The right to health coupled with the right to breathe clean air
leaves no manner of doubt that it is important that air pollution
deserves to be eliminated and one of the possible methods of
reducing it during Diwali is by continuing the suspension of
licences for the sale of fireworks and therefore implicitly,
prohibiting the bursting of fireworks.

E 68. In our considered opinion, continuing the suspension of
licences might be too radical a step to take for the present – a
graded and balanced approach is necessary that will reduce and
gradually eliminate air pollution in Delhi and in the NCR caused
by the bursting of fireworks. At the same time it is necessary to
ensure that injustice is not caused to those who have already been
granted a valid permanent licence to possess and sell fireworks in
F Delhi and the NCR. The graded and balanced approach is not
intended to dilute our primary concern which is and remains the
health of everybody and the human right to breathe good quality
air or at least not be compelled to breathe poor quality air.
Generally speaking this must take precedence over the
G commercial or other interest of the applicant and those granted a
permanent licence to possess and sell fireworks.

H 69. But, from the material before us, it cannot be said with any
great degree of certainty that the extremely poor quality of air in
Delhi in November and December 2016 was the result only of

bursting fireworks around Diwali. Certainly, there were other causes as well, but even so the contribution of the bursting of fireworks cannot be glossed over. Unfortunately, neither is it possible to give an accurate or relative assessment of the contribution of the other identified factors nor the contribution of bursting fireworks to the poor air quality in Delhi and in the NCR. Consequently, a complete ban on the sale of fireworks would be an extreme step that might not be fully warranted by the facts available to us. There is, therefore, some justification for modifying the interim order passed on 11th November, 2016 and lifting the suspension of the permanent licences.

70. At the same time, it cannot be forgotten that admittedly there is a huge quantity of fireworks in Delhi and in the NCR and the figure has been provided to us by the applicant. Similarly, there can be no doubt that the Delhi Police had issued a large number of temporary licences in 2016 and it would not be unreasonable to assume that around and during Diwali, there would have been some illegal temporary shops set up, whether known or not known to the police. We do not have the figures with regard to the NCR, but we assume that like in Delhi, a large number of temporary licences have been issued for the possession and sale of fireworks. Therefore, there is a need to regulate the availability and sale of fireworks in Delhi and the NCR.”

11. It was followed by the following directions:

“71. As mentioned above, the health of the people in Delhi and in the NCR must take precedence over any commercial or other interest of the applicant or any of the permanent licensees and, therefore, a graded regulation is necessary which would eventually result in a prohibition. Taking all factors into consideration, we are of the view that the following orders and directions are required to be issued and we do so:

(1) The directions issued by this Court in *Sadar Bazar Fire Works (Pucca Shop) Association* shall stand partially modified to the extent that they are not in conformity with the Explosives Rules which shall be implemented in full by the concerned authorities. Safety from fire hazards is one of our concerns in this regard.

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- A (2) Specifically, Rule 15 relating to marking on explosives and packages and Rule 84 relating to temporary shops for possession and sale of fireworks during festivals of the Explosives Rules shall be strictly enforced. This should not be construed to mean that the other Rules need not be enforced – all Rules should be enforced. But if the fireworks do not conform to the requirements of Rules 15 and 84, they cannot be sold in the NCR, including Delhi and this prohibition is absolute.
- B (3) The directions issued and restrictions imposed in the order passed by this Court on 18th July, 2005 in *Noise Pollution (V)* shall continue to be in force.
- C (4) The concerned police authorities and the District Magistrates will ensure that fireworks are not burst in silence zones that is, an area at least 100 meters away from hospitals, nursing homes, primary and district health-care centres, educational institutions, courts, religious places or any other area that may be declared as a silence zone by the concerned authorities.
- D (5) The Delhi Police is directed to reduce the grant of temporary licences by about 50% of the number of licences granted in 2016. The number of temporary licences should be capped at 500. Similarly, the States in the NCR are restrained from granting more than 50% of the number of temporary licences granted in 2016. The area of distribution of the temporary licences is entirely for the authorities to decide.
- E (6) The Union of India will ensure strict compliance with the Notification GSR No. 64(E) dated 27th January, 1992 regarding the ban on import of fireworks. The Union of India is at liberty to update and revise this notification in view of the passage of time and further knowledge gained over the last 25 years and issue a fresh notification, if necessary.
- F (7) The Department of Education of the Government of NCT of Delhi and the corresponding Department in other States in the NCR shall immediately formulate a plan of action, in not more than 15 days, to reach out to children in all the schools through the school staff, volunteers and NGOs to sensitize and educate school children on the health hazards and ill-effects of breathing polluted
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air, including air that is polluted due to fireworks. School children should be encouraged to reduce, if not eliminate, the bursting of fireworks as a part of any festivities. A

(8) The Government of NCT of Delhi and other States in the NCR may consider interacting with established medical institutions for issuing advisories cautioning people about the health hazards of bursting fireworks. B

(9) The interim direction issued by this Court on 31st July, 2017 prohibiting the use of compounds of antimony, lithium, mercury, arsenic and lead in the manufacture of fireworks is made absolute. In addition, the use of strontium chromate in the manufacture of fireworks is prohibited. C

(10) Fireworks containing aluminum, sulphur, potassium and barium may be sold in Delhi and in the NCR, provided the composition already approved by PESO is maintained. It is the responsibility of PESO to ensure compliance of the standards it has formulated. D

(11) Since there are enough fireworks available for sale in Delhi and the NCR, the transport of fireworks into Delhi and the NCR from outside the region is prohibited and the concerned law enforcement authorities will ensure that there is no further entry of fireworks into Delhi and the NCR till further orders. In our opinion, even 50,00,000 kg of fireworks is far more than enough for Dussehra and Diwali in 2017. The permanent licensees are at liberty to exhaust their existing stock of fireworks in Delhi and the NCR and, if that is not possible, take measures to transport the stocks outside Delhi and the NCR. E
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(12) The suspension of permanent licences as directed by the order dated 11th November, 2016 is lifted for the time being. This might require a review after Diwali depending on the ambient air quality post Diwali. However, it is made explicit that the sale of fireworks by the permanent licensees must conform to the directions given above and must be fully in compliance with the Explosives Rules. We were informed that the permanent licences were issued by PESO and therefore the responsibility is on PESO to ensure compliance. G

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- A (13) While lifting the suspension on the permanent licences already granted, we put these licensees on notice for Dussehra and Diwali in 2018 that they will be permitted to possess and sell only 50% of the quantity permitted in 2017 and that this will substantially reduce over the next couple of years. The permanent licensees are at liberty to file objections to this proposed direction within 30 days from today and thereafter the objections if any will be heard and decided. If no objections are filed, this direction will become absolute without any further reference to any licensee.
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- C (14) Since there is a lack of clarity on the safety limits of various metals and constituents used in fireworks, a research study must be jointly carried out by the CPCB and the FRDC laying down appropriate standards for ambient air quality in relation to the bursting of fireworks and the release of their constituents in the air. While Schedule VII of the Environment (Protection) Rules, 1986 does deal with several metals, but as we have seen there are several other metals or constituents of fireworks that have not been studied by the CPCB and no standards have been laid down with regard to the concentration of these metals or constituents in the ambient air. The CPCB has assured us that it will complete the exercise by 15th September, 2017 but keeping in mind its track record subsequent to the order dated 11th November, 2016 this does not seem possible. Therefore, we grant time to the CPCB to come out with definite standards on or before 30th September, 2017.
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- F (15) In any event, a research study also needs to be conducted on the impact of bursting fireworks during Dussehra and Diwali on the health of the people. We, therefore, appoint a Committee to be chaired by the Chairperson of the CPCB and consisting of officers at the appropriate level from the National Physical Laboratory, Delhi, the Defence Institute of Physiology and Allied Sciences, Timarpur, Delhi, the Indian Institute of Technology-Kanpur, scientists from the State Pollution Control Boards, the Fire Development and Research Centre, Sivakasi and Nagpur and the National Environment Engineering Research Institute (NEERI) nominated by the Chairperson of the CPCB to submit a report in this regard preferably on or before 31st December, 2017.
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(16) Keeping in mind the adverse effects of air pollution, the human right to breathe clean air and the human right to health, the Central Government and other authorities should consider encouraging display fireworks through community participation rather than individual bursting of fireworks.”

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12. After the aforesaid order was passed, many applications were filed, from both sides, seeking modification of some of the aforesaid directions. Insofar as the petitioners are concerned, in their application for modification, they prayed for removal of Directions Nos. 5 and 10 to 13, which was in essence a prayer for restoration of earlier order dated November 11, 2016. Insofar as fireworks manufacturers, traders and license holders of the fireworks/firecrackers are concerned, they wanted that relaxation given in the order dated September 12, 2017 be further liberalised.

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13. After hearing both the parties, orders dated October 09, 2017 were passed. The Court accepted the fact that burning of firecrackers during *Diwali* was not the only reason for air pollution in Delhi and NCR and there was a need to tackle those factors as well. However, it was observed that the immediate impact of use of fireworks and firecrackers bursting during *Diwali* is an altogether different aspect. The Court noted that there is direct evidence of deterioration of air quality at alarming levels, which happens every year. Burning of these firecrackers during *Diwali* in 2016 had shot up PM levels by three times, making Delhi the worst city in the world insofar as air pollution is concerned. Direct and immediate cause thereof was burning of crackers during *Diwali*. The Court also remarked that every year before *Diwali* there are attempts on the part of the Government (Ministry of Environment, Government of India as well as Delhi Government), Media, NGOs and various other groups to create awareness in the general public about the ill-effects of bursting of these crackers. Campaigns are held in the schools wherein children are discouraged to have fireworks. Thus, there is virtually a consensus in the society that crackers should not be burnt during *Diwali*, which can be celebrated with equal fervour by various other means as well. Irony is that when causes are brought in the Court, there is a resistance from certain quarters. Moreover, there are adequate statutory provisions, aid whereof can be taken to ban the sale of these crackers.

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A 14. The Court also took into consideration three substantial
submissions which were made by the petitioners, viz.: (a) CPCB had
taken a stand, nearly twenty years ago, that Sulphur in fireworks should
not be permitted as Sulphur on combustion produces Sulphur Dioxide
and the same is extremely harmful to health. The CPCB has stated that
B between 9:00 p.m. to midnight on *Diwali* day the levels of Sulphur
Dioxide content in the air are dangerously high. Moreover, all the above
authorities were also unanimous in their view that crackers should only
be burst in designated places. Also the CPCB had specifically stated
that joined crackers should be banned. Secondly, in the order dated
C November 11, 2016, licenses were suspended primarily for the reason
that rising in the PM levels at alarming proportion was because of burning
of crackers during *Diwali*, which had adverse harmful affect and,
therefore, there was no reason to relax this condition. Another significant
argument which was taken note of was that the order dated November
D 11, 2016 was passed immediately after the *Diwali* in the year 2016 and
the effect of that order had not been tested. Going by these considerations,
the Court decided to suspend the order dated September 12, 2017 at
least during the *Diwali* of 2017 with the following directions:

“14...To put it clearly, though we are not tweaking with the
various directions contained in the Orders dated September 12,
E 2017, the effect of that Order would not be given during this Diwali
and, therefore, we are making it effective only from November
01, 2017. We are conscious of the fact that after the said order
was passed, the police may have issued temporary licences.
Accordingly, those are suspended forthwith so that there is no
further sale of the crackers in Delhi and NCR. Further orders in
F this behalf can be passed on assessing the situation that would
emerge after this Diwali season...”

15. As expected, spate of applications have been filed, most of
which emanate from the aforesaid orders dated October 09, 2017. Many
parties have intervened. Most of the interventionists are supporting the
G petitioners and want permanent ban on the burning of crackers during
Diwali. Some have even prayed that this ban be extended to the whole
country and should not be limited to only Delhi and NCR. IAs were also
filed seeking ban on crop burning. The opposite group consists of
manufacturers of crackers, manufacturers’ association and license
H holders. The State of Tamil Nadu has come forward to support this

category. Additionally, one interventionist, namely Indic Collective (applicant in IA No. 105355 of 2017), is also opposing the ban contending that burning of crackers during *Diwali* is a religious activity which is in vogue for time immemorial and, therefore, it should not be banned. A

16. It is not necessary to take note of the arguments of each of the counsel appearing on either side. For the sake of convenience, arguments of the petitioners as well as those who have supported the petitioners' cause and the arguments of the other group which is opposing the prayers made by the petitioners, are collated and we state below these arguments and counter arguments in consolidated manner: B

17. *Petitioners' Arguments:* C

(a) As far as the petitioners are concerned, they have proceeded on the premise that undeniable fact is that as a result of burning of crackers during *Diwali* $PM_{2.5}$ reach an alarmingly high level which certainly is injurious to health. It is argued that the adverse affect thereof on the health of citizens, particularly children, is irreversible. It causes asthma, coughing, bronchitis, retarded nervous system breakdown and even cognitive impairment. D

(b) The official respondents had failed to address the issues and carry out desired studies in spite of the directions of this Court. Various committees set up are examining the question as to what kind of metal should be used in the manufacture of crackers. So far no study has been conducted on the ill-effect caused by $PM_{2.5}$. E

(c) Studies by CPCB had categorically found that burning of crackers during *Diwali* was contributing to air as well as noise pollution in an alarming manner. Copies of these studies showing continuous ambient air quality during *Diwali* annexed with IA No. 109720 of 2017 is referred to. Contents of the affidavit of CPCB dated January 05, 2018 has also been relied upon. F

The petitioners also rely upon the report filed by the Union of India, through the Ministry of Environment, Forest and Climate Change, wherein ill-effects of fireworks are accepted and measures suggested to tackle the same. G

Opinions of prominent doctors mentioning spike in the respiratory problems among children and patients are also pointed out.

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A (d) Dealing with the argument of the manufacturers and traders of firecrackers based on Article 19(1)(g) of the Constitution of India, namely, fundamental right to carry on business, the submission of the petitioners is that going by the ill-effects of the firecrackers, no such right can be claimed as principle of *res extra commercium* would apply. In support, additional affidavit filed on July 26, 2017 as well as in July 2018 are referred to wherein the petitioners have sought to highlight the following aspects:

B (i) These manufacturers were employing child labour. At one point of time, almost one lakh children were employed in this industry. Though it was admitted that this position does not exist any longer in view of strict measures taken by the Government.

C (ii) The manufacturing of firecrackers generates a lot of waste which adds to pollution as sufficient measures are not undertaken to deal with this waste.

D (iii) Number of deaths as well as injuries to persons are caused every year due to poor storage which results in occasional accidents. Likewise, the burning of these crackers also results in injuries.

E (iv) Firework also leads to lot of noise and air pollution as well. Judgments of this Court in *Vellore Citizens' Welfare Forum v. Union of India and Others*, (1996) 5 SCC 647; and *A.P. Pollution Control Board v. Prof. M.V. Nayudu (Retd.) and Others*, (1999) 2 SCC 718, have been relied upon.

F In the alternative, it was argued that even if it is accepted that argument of Article 19(1)(g) of the Constitution is available to the manufacturers and traders, such a ban on burning crackers during *Diwali* would amount to reasonable restriction having regard to the fact that right to health was also a fundamental right guaranteed under Article 21 of the Constitution. It was also submitted that the cost in the form of medical expenses which are incurred for treatment of those who suffered as a result of burning of crackers is equally high or even may be higher.

G (e) One of the arguments of the opposite side was that there were no sufficient studies as to what extent the burning of crackers is contributing towards air and noise pollution and whether it was such a serious problem which warrants ban. To this, reply of the petitioners

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was that in the field of environmental laws, precautionary principle was also applicable which does not need exact studies or material. A

(f) Insofar as argument of burning of crackers during *Diwali*, as a part of right of religious practice is concerned, the refutation of the petitioners is that such an argument has already been rejected by this Court in *Vellore Citizens' Welfare Forum* case. It was further submitted that burning of crackers during *Diwali* is not a core and essential religious practice and even if it is so, Article 25 was subject to Article 21 of the Constitution. Judgment in *Noise Pollution (V), in Re*, (2005) 5 SCC 733, was relied upon in this regard. B

18. *Arguments of the opposite side:* C

The respondents, who are opposing the prayers made in the writ petitions and the IAs, made the submissions to the following effect:

(i) Burning of crackers during *Diwali* does not have any significant adverse affect on the environment. It is argued that there is no study till date which has come to such a conclusion. The Deepawali Monitoring Report, 2017 of CPCB is relied upon for this purpose and on that basis it is contended that the factors which contributed to the problem were not because of crackers burning during *Diwali*. Ambient air quality before and after *Diwali* reflects that there was no spike immediately after *Diwali*. It was accepted that situation of air pollution in Delhi and NCR is 'generally' worrying. However, there are multiple causes which lead to polluting air and such a position existed even before *Diwali*, which showed that other factors played dominant role. D E

(ii) Insofar as presence of PM_{2.5} in the air is concerned, studies of CPCB are relied upon, on the basis of which attempt is made to show that: (a) spike was not so much during *Diwali* days; (b) increase in PM_{2.5} in the air does not remain for long, i.e. it does not linger for many days; and (c) it is manageable as well. F

Reports of Indian Institute of Technology, Kanpur; National Aeronautics and Space Administration (NASA), USA; a professor from Harvard University; and an affidavit dated January 05, 2018 filed by CPCB were referred to in support. G

(iii) It is submitted that pursuant to orders dated September 12, 2017 whereby the Court had directed that a research study needs to be

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A conducted on the impact of bursting fireworks during *Dussehra* and *Diwali* on the health of people, no such empirical data has emerged so far for want of detailed studies.

In nutshell, the argument was that in the absence of any definite study attributing the worsening of air quality to the fireworks during *Diwali*, the right of the manufacturers and traders under Article 19(1)(g), which is a fundamental right to carry on trade, should not be made to suffer till the time there is a complete study in this behalf.

(iv) It is also argued that the revenue generated from the manufacturing and sale of fireworks is to the tune of Rs.6,000 crores per annum. Further, this industry has given employment to five lakh families. Such a revenue to the State as well as employment to large number of workers on which five lakh families sustain cannot be put in jeopardy by imposing a total ban. It was emphasised that there is a necessity to adopt a balanced approach. For this purpose, Status Report and affidavit of the Ministry of Environment, Forest and Climate Change has been relied upon which suggested eco-friendly firecrackers. Advisory dated March 07, 2008 issued by the Petroleum and Explosives Safety Organisation (PESO), which comes under the Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India, was also relied upon, as per which the fireworks manufacturers in India were advised to ensure that the firecrackers manufactured by them are within the limits prescribed in Annexure-I to the said Advisory dated March 07, 2008.

(v) The State of Tamil Nadu also supported the cause of the manufacturers and traders of the firecrackers. It was argued that the study undertaken by CPCB pursuant to the directions issued by this Court was conducted by the Committee which did not have a representative from the Fireworks Research and Development Centre (FRDC) which was not even informed about the development of this case. It was emphasised that any proper study in this behalf should address following aspects:

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- a) Socio-economic effect of the ban needs to be examined as it may cause extreme economic hardship,
 - b) There should be a proper study about the other factors which were leading to air pollution, like construction activity, etc., which are not banned.
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c) Banning of an activity is an extreme measure. The study should focus on the alternatives available in the present day technology which may be deployed to ensure that pollution free firecrackers can be manufactured. A

(vi) Indic Collective (applicant in IA No. 105355 of 2017) opposed the prayer of banning of fireworks during *Diwali* on the ground that it was a religious practice scrupulously followed by the Hindus from time immemorial and it had become a core and essential religious practice which was protected under Article 25 of the Constitution as their fundamental right. B

19. The arguments of the parties recorded above would show that the submissions for and against almost remain the same, which were advanced on earlier occasions, though the focus of both the sides was more nuanced. In the process, the events and developments which have taken place after passing the order dated October 09, 2017 have also been relied upon by both the parties. C

20. Before proceeding to deal with these submissions, it may be apposite to take note of the study that has been undertaken by CPCB on the basis of the directions of this Court in its order dated September 12, 2017. D

21. Following the directions of this Court, a Committee was appointed to be chaired by the Chairperson of the CPCB. This Committee invited Dr. M.K. Daga, Professor Director, Maulana Azad Medical College (MAMC), as health expert to study the methodology. Dr. Daga suggested that considering the time available, a short-term study based on questionnaire survey, hospital data collection and sampling at a few locations can be conducted. This methodology proposed by Dr. Daga was agreed to by the Committee. The Committee requested MAMC to submit a proposal accordingly. On submission of project proposal, the Committee awarded the project on '*Health Impact Assessment on Firecracker Burning During Dussehra And Diwali*' to MAMC. The scope included questionnaire survey for respiratory, skin, air, eye and relevant symptoms during pre and post *Diwali*, clinical study on lung function and urine samples of randomly selected subjects, and data analysis. After conducting this survey, a draft report was prepared and ultimately it was finalised after incorporating the comments from the Members of the Committee. As per this study on the afore-mentioned subject, following are the major findings: E
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- A “The respiratory system related symptoms and signs were not much different during pre and post Dussehra and Diwali. Although there was some increase in cough and breathlessness, but this did not translate into any significant illness requiring immediate medical attention. Other system related complaints were also not much different during pre and post Dussehra and
- B Diwali.
- C There was evidence of increased values of barium and strontium in urine samples of many subjects. These are some of the metals used in firecracker manufacturing. Increased levels in urine do reflect a probability of exposure. However, all other elements are not increased to substantiate the effect of bursting of firecrackers. It is also possible that the individuals were exposed due to bursting of firecrackers directly or indirectly in their locality.
- D Air quality did worsen during Diwali and symptoms of eye, increased coughing, relatively more hospital visits, increased noise levels and high metal levels in urine do reflect adverse impact of firecracker bursting. However, it was not significant statistically. A long term study would be required to assess long term health impacts of firecracker bursting.”
- E 22. Affidavit filed by CPCB also states that in compliance of the orders dated October 09, 2017 of this Court the Air Quality Monitoring Committee during *Dussehra* and *Diwali* was conducted by CPCB, a report whereof is annexed with its affidavit. As per that report, the salient features are as under:
- F “a) That, slight increase in PM_{10} concentration was observed in two locations i.e. Pitampura and Siri Fort on Dussehra day.
- b) That, $PM_{2.5}$ mass concentrations were found lower on post Dussehra day at all stations and it was highest on pre Dussehra day.
- G c) That the concentrations of SO_2 and NO_2 during pre Dussehra, Dussehra and post Dussehra days remained within limits.
- d) That, though the actual $PM_{2.5}$ mass concentrations were declined on Dussehra day, certain specific elemental
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concentration like Aluminum, Potassium and Barium showed increment on Dussehra day, which indicate some firecracker bursting has affected air quality. A

e) That, on Diwali day both PM_{10} and $PM_{2.5}$ increased 2-3.5 fold of the levels recorded seven days before Diwali and the Diwali peaks of $PM_{2.5}$ declined in three days. B

f) Both PM_{10} and $PM_{2.5}$ were reported higher in post Diwali day compared to pre Diwali at all stations.

g) SO_2 remained within prescribed standard limit with slight increment on Diwali day. NO_2 also reported within standard limit at all locations on Diwali day. C

h) That, the elements like Al, S, K, Cl_2 , Ba, Sr all have registered their presence in $PM_{2.5}$ collected on Diwali day, and the concentration of Al observed 4 to 6 times higher than that of short-term standards/critical values of 40 $\mu g/m^3$ proposed by CPCB. D

i) $PM_{2.5}$ was reduced by 39% compared to 2016 Diwali day.

j) Sulphur got reduced by 20%, Potassium by 30%, Ca, Cu, Zn, Sb by about 35-40%, Fe&Ba by about 50%, Strontium by 64% and Al and Cl_2 by 11%.” E

23. It can be discerned from the above that the air quality had worsened during *Diwali*. There were more patients with symptoms of eye, increased coughing and patients with high metal levels in urine. Even noise level had increased. These are the adverse impacts of firecracker bursting, though the study mentions that statistically it was not a significant increase. F

24. The study has also found that actual $PM_{2.5}$ mass concentrations increased due to firecracker bursting, which had affected air quality. On *Diwali* day both PM_{10} and $PM_{2.5}$ had 2-3.5 fold increase. Also, PM_{10} and $PM_{2.5}$ were reported higher in post-*Diwali* day compared to pre-*Diwali* at all stations. Another significant finding is that $PM_{2.5}$ was reduced by 39% compared to 2016 *Diwali*, presumably due to the ban order on the sale of crackers which was passed on October 09, 2017, which led to lesser quantum of fireworks. G

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A 25. Two significant features emerge from the above. First, due to fireworks on *Diwali* day, PM_{2.5} levels go up. Secondly, when there was lesser fireworks in 2017, it had reduced the PM_{2.5} levels as compared to the earlier *Diwali* in the absence of ban.

B 26. It is an accepted fact that bursting of firecrackers during *Diwali* is not the only reason for deterioration of air quality. There are other factors as well. It calls for necessity to tackle the other contributory factors for air pollution and making the air quality as 'very poor' and even 'poor'. Unregulated construction activity which generates lot of dust and crop burning in the neighbouring States are the two other major reasons, apart from certain other reasons, including vehicular pollution etc. The moot question in such a scenario is as to whether the menace due to fireworks during *Diwali* or other festivals/occasions should be left untouched and the Court should allow the situation to prevail as it is, only because it is not the sole reason for causing air pollution? Answer has to be in the negative.

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D 27. Once it is accepted that PM_{2.5} level goes alarmingly higher on *Diwali* and post-*Diwali*, which is the result of bursting of firecrackers, it is necessary to understand the adverse affect on health of persons of this particulate in air, even if such a situation remains only for few days. In this behalf, we may refer to the opinions of some experts/prominent doctors in the field, which have been placed on record by the petitioners.

E 28. Dr. Arvind Kumar, who interfered in the matter, filed his affidavit on August 14, 2018, wherein he has *inter alia* stated as under:

F "7. I have consistently found that in the immediate aftermath of *Diwali*, there is an increase in the number of people coming with chest ailments and many of my operated patients returned with complaints of cough and breathlessness without any other cause for the same. This has forced me to carry out innumerable chest x-rays and CT scans to confirm that the complaints are due to the exposure to toxins. For the sake of relief to the patient and in order to relieve them from bronchospasms, my colleagues and I are compelled to prescribe inhalers which have brochodilators and inhaled steroids, apart from cough suppressants and antibiotics. Media reports suggest that there has been an increase in asthma medicine sales by 43% due to pollution (Hindustan Times, May 02, 2017). While earlier, it was believed that children with

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asthma would outgrow the affliction, in the present circumstances, this seems challenging. A

8. Both at AIIMS and at Sir Ganga Ram Hospital, there has been a significant increase in the number of patients I would see in my OPD in the days immediately following Diwali, and I have no doubt that this was on account of sudden exposure to the deadly cocktail consisting of extremely high levels of toxic gases, particulate matter and metallic compounds. Each exposure to firework emissions not only leads to acute disastrous effects but also causes cumulative long-term irreversible damage. Once the $PM_{2.5}$ particle gets deposited in the lungs, it never leaves, thereby affecting the linking for life and diminishing breathing capacity. This affects not only the respiratory system, but also the cardio-vascular system (heart attacks and hypertension), nervous system (strokes and developmental abnormalities in children), reproductive system and virtually every other health function including the bladder and kidneys. B
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9. It would be useful to refer to two studies conducted ten years apart by a team including Prof. Sundeep Salvi, Director Chest Research Foundation, Pune and Member of the Government of India's Steering Committee on Air Pollution & Health. The first one in 2007 was presented at the Annual Congress of the European Respiratory Society at Stockholm and reveals the harmful health effects of CO, SOx and NOx from fireworks. E

10. The second is a detailed study on the amount of Particulate Matter in various types of fireworks in India and this was presented at the meeting of the European Respiratory Society at Milan in 2017. This has since been published in the European Respiratory Journal, and examines the personal exposure levels of fireworks (as against a general study of ambient air). In these isolated and controlled circumstances, the exposure to $PM_{2.5}$ was found to be as high as 64,5000 u/m_3 ." F
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29. From the aforesaid it can be gathered that when $PM_{2.5}$ crosses the normal limits, even if it remains in the air for few days, it becomes severe health hazard thereby causing serious health problems. Unfortunately such problems are virtually irreversible, which means that a person whose health gets affected because of this particulate has a H

A long suffering. In view thereof, argument in opposition that air quality that gets worsened during *Diwali* remains only for few days would be of no consequence as even in few days it causes severe harm to the health of the people, that too for prolonged duration.

30. From the aforesaid discussion, the position can be summed up by stating that though burning of crackers during *Diwali* is not the only reason for worsening air quality, at the same time, it definitely contributes to air pollution in a significant way. Again, even when no studies are undertaken on long-term impact thereof, the CPCB Committee, which did this exercise taking it as a short-term project which was assigned to MAMC, has returned a definite finding about deterioration in air quality during *Diwali* because of burning of crackers. It has also shown that post-*Diwali* air pollution in 2017 was less compared to the 2016 *Diwali* which was the result of lesser fireworks in 2017. This again indicates a direct causal connection between burning crackers during *Diwali* and air pollution. Another immediate effect of burning of crackers is that it results in substantial increase in PM_{2.5} level which is a very serious health hazard. In fact, this results in severe noise pollution as well which has acute psychological, mental and even physical affect on animals. In the application seeking intervention and directions (IA No. 68897 of 2018) filed by Gauri Maulekhi, the applicant has placed on record plethora of literature based on various studies depicting profound affect of noise/sound on the health of animals, extending to their neuroendocrine system, reproduction and development, metabolism, cardiovascular health, cognition and sleep, audition, immune system, DNA integrity and gene expression. Fireworks sometimes results in temporary or permanent hearing impairment in animals. Further, dogs are also known to display psychological symptoms of stress during this time. So much so, fireworks has traumatising affect even on birds. Deafening sound which the crackers produce on bursting are known to disorient birds and responsible for their displacement from their nests. Even the respiratory system of the birds gets affected. Studies also show that the sound of crackers has affect on milch cattle. As the cattle is scared, adrenaline is released in its body which inhibits oxytocin, a hormone which helps the milk cattle to release milk thereby affecting the production of milk.

31. The aforesaid findings are sufficient to negate the arguments of the opposite side that there is absence of scientific study about the adverse affect of firecrackers during *Diwali*. In environmental law,

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‘precautionary principle’ is one of the well recognised principles which is followed to save the environment. It is rightly argued by the petitioners that this principle does not need exact studies/material. The very word ‘precautionary’ indicates that such a measure is taken by way of precaution which can be resorted to even in the absence of definite studies. In *Vellore Citizens’ Welfare Forum*, this Court explained the principle in the following manner:

“11. Some of the salient principles of “Sustainable Development”, as culled out from Brundtland Report and other international documents, are Inter-Generational Equity, Use and Conservation of Natural Resources, Environmental Protection, the Precautionary Principle, Polluter Pays Principle, Obligation to Assist and Cooperate, Eradication of Poverty and Financial Assistance to the developing countries. We are, however, of the view that “The Precautionary Principle” and “The Polluter Pays Principle” are essential features of “Sustainable Development”. The “Precautionary Principle” — in the context of the municipal law — means:

(i) Environmental measures — by the State Government and the statutory authorities — must anticipate, prevent and attack the causes of environmental degradation.

(ii) Where there are threats of serious and irreversible damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

(iii) The “onus of proof” is on the actor or the developer/ industrialist to show that his action is environmentally benign.

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14. In view of the above-mentioned constitutional and statutory provisions we have no hesitation in holding that the Precautionary Principle and the Polluter Pays Principle are part of the environmental law of the country.

15. Even otherwise once these principles are accepted as part of the Customary International Law there would be no difficulty in accepting them as part of the domestic law. It is almost an accepted proposition of law that the rules of Customary International Law which are not contrary to the municipal law

A shall be deemed to have been incorporated in the domestic law and shall be followed by the courts of law. To support we may refer to Justice H.R. Khanna's opinion in *A.D.M. v. Shivakant Shukla*, *Jolly George Varghese case* and *Gramophone Co. case*.

B 16. The constitutional and statutory provisions protect a person's right to fresh air, clean water and pollution-free environment, but the source of the right is the inalienable common law right of clean environment..."

C 32. The precautionary principle accepted in the aforesaid judgment was further elaborated in *A.P. Pollution Control Board's* case as under:

D "31. The "uncertainty" of scientific proof and its changing frontiers from time to time has led to great changes in environmental concepts during the period between the Stockholm Conference of 1972 and the Rio Conference of 1992. In *Vellore Citizens' Welfare Forum v. Union of India* a three-Judge Bench of this Court referred to these changes, to the "precautionary principle" and the new concept of "burden of proof" in environmental matters. Kuldip Singh, J. after referring to the principles evolved in various international conferences and to the concept of "sustainable development", stated that the precautionary principle, the polluter-pays principle and the special concept of onus of proof have now emerged and govern the law in our country too, as is clear from Articles 47, 48-A and 51-A(g) of our Constitution and that, in fact, in the various environmental statutes, such as the Water Act, 1974 and other statutes, including the Environment (Protection) Act, 1986, these concepts are already implied. The learned Judge declared that these principles have now become part of our law. The relevant observations in the *Vellore case* in this behalf read as follows: (SCC p. 660, para 14)

G "14. In view of the above-mentioned constitutional and statutory provisions we have no hesitation in holding that the *precautionary principle* and the polluter-pays principle are part of the environmental law of the country."

(emphasis supplied)

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The Court observed that even otherwise, the abovesaid principles are accepted as part of the customary international law and hence there should be no difficulty in accepting them as part of our domestic law. In fact, on the facts of the case before this Court, it was directed that the authority to be appointed under Section 3(3) of the Environment (Protection) Act, 1986

“shall implement the ‘precautionary principle’ and the ‘polluter-pays principle’”.

The learned Judges also observed that the new concept which places the burden of proof on the developer or industrialist who is proposing to alter the status quo, has also become part of our environmental law.

32. The *Vellore judgment* has referred to these principles briefly but, in our view, it is necessary to explain their meaning in more detail, so that courts and tribunals or environmental authorities can properly apply the said principles in the matters which come before them.

33. A basic shift in the approach to environmental protection occurred initially between 1972 and 1982. Earlier, the concept was based on the “assimilative capacity” rule as revealed from Principle 6 of the Stockholm Declaration of the U.N. Conference on Human Environment, 1972. The said principle *assumed* that science could provide policy-makers with the information and means necessary to avoid encroaching upon the capacity of the environment to assimilate impacts and it *presumed* that relevant technical expertise would be available when environmental harm was predicted and there would be sufficient time to act in order to avoid such harm. But in the 11th Principle of the U.N. General Assembly Resolution on World Charter for Nature, 1982, the emphasis shifted to the “precautionary principle”, and this was reiterated in the Rio Conference of 1992 in its Principle 15 which reads as follows:

“*Principle 15.*—In order to protect the environment, the *precautionary approach* shall be widely applied by States according to their capabilities. Where there are threats of

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A serious or irreversible damage, lack of full *scientific certainty* shall not be used as a reason for proposing cost-effective measures to prevent environmental degradation.”

34. In regard to the cause for the emergence of this principle, Charmian Barton, in the article earlier referred to in Vol. 22, Harv. Envtt. L. Rev. (1998), p. 509 at p. 547 says:

B “There is nothing to prevent decision-makers from assessing the record and concluding that there is inadequate information on which to reach a determination. If it is not possible to make a decision with ‘some’ confidence, then it *makes sense to err on the side of caution and prevent* activities that may cause serious or irreversible harm. An informed decision can be made at a later stage when additional data is available or resources permit further research. To ensure that greater caution is taken in environmental management, implementation of the principle through *judicial and legislative means* is necessary.”

D In other words, the inadequacies of science is the real basis that has led to the precautionary principle of 1982. It is based on the theory that it is better to err on the side of caution and prevent environmental harm which may indeed become irreversible.

E 35. The principle of precaution involves the anticipation of environmental harm and taking measures to avoid it or to choose the least environmentally harmful activity. It is *based* on scientific uncertainty. Environmental protection should not only aim at protecting health, property and economic interest but also protect the environment for its own sake. Precautionary duties must not only be triggered by the suspicion of concrete danger but also by (justified) concern or risk potential. The precautionary principle was recommended by the UNEP Governing Council (1989). The Bomako Convention also lowered the threshold at which scientific evidence might require action by not referring to “serious” or “irreversible” as adjectives qualifying harm.

G However, summing up the legal status of the precautionary principle, one commentator characterised the principle as still “evolving” for though it is accepted as part of the international customary law, “the consequences of its application in any potential situation will be influenced by the circumstances of each

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case”. (See First Report of Dr Sreenivasa Rao Pemmaraju — Special Rapporteur, International Law Commission dated 3-4-1998, paras 61 to 72.)”

33. In such cases which pertain to the protection of environment, thrusting of ‘*onus of proof*’ on the developer/industrialist in ***Vellore Citizens’ Welfare Forum*** was also elaborated by the Court in the following manner:

“36. We shall next elaborate the new concept of burden of proof referred to in the *Vellore case* at p. 658. In that case, Kuldip Singh, J. stated as follows: (SCC p. 658, para 11)

“(iii) The ‘onus of proof’ is on the actor or the developer/ industrialist to show that his action is environmentally benign.”

37. It is to be noticed that while the inadequacies of science have led to the “precautionary principle”, the said “precautionary principle” in its turn, has led to the special principle of *burden of proof* in environmental cases where burden as to the absence of injurious effect of the actions proposed, — is placed on those who want to change the status quo [Wynne, *Uncertainty and Environmental Learning*, 2 Global Env’tl. Change 111 (1992) at p. 123]. This is often termed as a reversal of the burden of proof, because otherwise in environmental cases, those opposing the change would be compelled to shoulder the evidentiary burden, a procedure which is not fair. Therefore, it is necessary that the party attempting to preserve the status quo by maintaining a less polluted state should not carry the burden of proof and the party who wants to alter it, must bear this burden. [See James M. Olson: “*Shifting the Burden of Proof*”, 20 Env’tl. Law, p. 891 at p. 898 (1990).] [Quoted in Vol. 22 (1998), Harv. Env. Law Review, p. 509 at pp. 519, 550.]

38. The precautionary principle suggests that where there is an identifiable risk of serious or irreversible harm, including, for example, extinction of species, widespread toxic pollution in major threats to essential ecological processes, it may be appropriate to place the burden of proof on the person or entity proposing the activity that is potentially harmful to the environment. (See Report of Dr Sreenivasa Rao Pemmaraju,

A Special Rapporteur, International Law Commission, dated 3-4-1998, para 61.)”

34. This brings us to the next argument which is predicated on Article 19(1)(g) of the Constitution. Mr. Shankarnarayanan had submitted that principle of *res extra commercium* shall apply inasmuch as firecrackers are a health hazard, the manufacturers and traders thereof cannot claim any fundamental right to carry on business in this field. Such a plea may not be tenable. Therefore, it calls for a measure that would amount to a reasonable restriction.

35. It may be stressed that in *Vellore Citizens' Welfare Forum* case, this Court had banned the tanneries when it was found that they were causing immense damage to the environment. Thus, environment protection, which is a facet of Article 21, was given supremacy over the right to carry on business enshrined in Article 19(1)(g). We state at the cost of repetition that right of health, which is recognised as a facet of Article 21 of the Constitution and, therefore, is a fundamental right, assumes greater importance. It is not only the petitioners and other applicants who have intervened in support of the petitioners but the issue involves millions of persons living in Delhi and NCR, whose right to health is at stake. However, for the time being, without going into this debate in greater details, our endeavour is to strive at balancing of two rights, namely, right of the petitioners under Article 21 and right of the manufacturers and traders under Article 19(1)(g) of the Constitution.

36. Almost for the same reasons, argument predicated on Article 25 of the Constitution need not detain us. We proceed on the assumption that burning of crackers during *Diwali* is a part of religious practice. The question is as to whether it should be allowed to be continued in the present form without any regulatory measures, as a part of religious practice, even if it is proving to be a serious health hazard. We feel that Article 25 is subject to Article 21 and if a particular religious practice is threatening the health and lives of people, such practice is not entitled to protection under Article 25. In any case, balancing can be done here as well by allowing the practice subject to those conditions which ensure nil or negligible effect on health.

37. We now deal with the argument that banning the sale of firecrackers may lead to extreme economic hardship, namely, on the one hand loss of substantial revenue and on the other hand unemployment

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to lakhs of persons. This brings up the issue of connect or relationship between the law and economics. This aspect was considered by this Court in *Shivashakti Sugars Limited v. Shree Renuka Sugar Limited and Others*, (2017) 7 SCC 729, and the relevant portion whereof is reproduced below:

“43...Interface between Law and Economics is much more relevant in today’s time when the country has ushered into the era of economic liberalisation, which is also termed as “globalisation” of economy. India is on the road of economic growth. It has been a developing economy for number of decades and all efforts are made, at all levels, to ensure that it becomes a fully developed economy. Various measures are taken in this behalf by the policy-makers. The judicial wing, while undertaking the task of performing its judicial function, is also required to perform its role in this direction. It calls for an economic analysis of law approach, most commonly referred to as “Law and Economics” [Richard A. Posner in his book *Frontiers of Legal Theory* explains this concept as follows:”Economic analysis of law has heuristic, descriptive and normative aspects. As a heuristic, it seeks to display underlying unities in legal doctrines and institutions; in its descriptive mode, it seeks to identify the economic logic and effects of doctrines and institutions and the economic causes of legal change; in its normative aspect it advises Judges and other policy-makers on the most efficient methods of regulating conduct through law. The range of its subject-matter has become wide, indeed all-encompassing. Exploiting advances in the economics of nonmarket behaviour, economic analysis of law has expanded far beyond its original focus on antitrust, taxation, public utility regulation, corporate finance, and other areas of explicitly economic regulation. (And within that domain, it has expanded to include such fields as property and contract law.) The “new” economic analysis of law embraces such nonmarket, or quasi-nonmarket, fields of law as tort law, family law, criminal law, free speech, procedure, legislation, public international law, the law of intellectual property, the rules governing the trial and appellate process, environmental law, the administrative process, the regulation of health and safety, the laws forbidding discrimination in employment, and social norms viewed as a source

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A of, an obstacle to, and a substitute for formal law.”Posner also
mentioned that this interface between Law and Economics might
grandly be called “Economic Theory of Law”, which is built on a
pioneering article by Ronald Coase [R.H. Coase, “The Problem
of Social Cost”, 3 Journal of Law and Economics 1 (1960)]: ”The
B “Coase Theorem” holds that where market transaction costs are
zero, the law’s initial assignment of rights is irrelevant to
efficiency, since if the assignment is inefficient the parties will
rectify it by a corrective transaction. There are two important
corollaries. The first is that the law, to the extent interested in
C promoting economic efficiency, should try to minimize transaction
costs, for example by defining property rights clearly, by making
them readily transferable, and by creating cheap and effective
remedies for breach of contract....The second corollary of the
Coase Theorem is that where, despite the law’s best efforts, market
D transaction costs remain high, the law should simulate the market’s
allocation of resources by assigning property rights to the highest-
valued users. An example is the fair-use doctrine of copyright
law, which allows writers to publish short quotations from a
copyrighted work without negotiating with the copyright holder.
E The costs of such negotiations would usually be prohibitive; if
they were not prohibitive, the usual result would be an agreement
to permit the quotation, and so the doctrine of fair use brings about
the result that the market would bring about if market
transactions were feasible.”]. In fact, in certain branches of Law
there is a direct impact of Economics and economic
F considerations play predominant role, which are even recognised
as legal principles. Monopoly laws (popularly known as “Anti-
trust Laws” in USA) have been transformed by Economics. The
issues arising in competition laws (which has replaced monopoly
G laws) are decided primarily on economic analysis of various
provisions of the Competition Commission Act. Similar approach
is to be necessarily adopted while interpreting bankruptcy laws or
even matters relating to corporate finance, etc. The impress of
Economics is strong while examining various facets of the issues
arising under the aforesaid laws. In fact, economic evidence plays
a big role even while deciding environmental issues. There is a
growing role of Economics in contract, labour, tax, corporate and
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other laws. Courts are increasingly receptive to economic arguments while deciding these issues. In such an environment it becomes the bounden duty of the Court to have the economic analysis and economic impact of its decisions.”

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38. Applying the aforesaid principle, in the first blush it may appear that the aforesaid argument has substantial force in it. However, that would be only one side of the picture as there are two contra arguments which are sufficient to take the sheen out of the aforesaid plea. First aspect is that the argument of economic hardship is pitched against right to health and life. When the Court is called upon to protect the right to life, economic effect of a particular measure for the protection of such right to health will have to give way to this fundamental right. Second factor, which is equally important, is that the economic loss to the State is pitched against the economic loss in the form of cost of treatment for treating the ailments with which people suffer as a result of burning of these crackers. Health hazards in the form of various diseases that are the direct result of burning of crackers have already been noted above. It leads to asthma, coughing, bronchitis, retarded nervous system breakdown and even cognitive impairment. Some of the diseases continue on a prolonged basis. Some of these which are caused because of high level of PM_{2.5} are even irreversible. In such cases, patients may have to continue to get the medical treatment for much longer period and even for life. Though there are no statistics as to what would be the cost for treating such diseases which are as a direct consequence of fireworks on these occasions like *Diwali*, it can safely be said that this may also be substantial. It may be more than the revenue which is generated from the manufacturers of the crackers. However, we say no more for want of precise statistical data in this behalf.

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39. With this, we come to the most important issue, viz. whether there has to be a complete ban on display of fireworks during *Diwali* or it can be controlled/regulated in a manner which may not result into air pollution or may be least intrusive.

40. It would be significant to mention at this stage that there have been lots of efforts for production of firecrackers which do not contain harmful chemicals and thereby not causing air pollution, which are even termed as ‘*Green Crackers*’. The Union of India was asked to delve on this aspect. In fact, during the hearing of this matter, order was

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A passed on August 14, 2018 giving direction to respondent No.1 to give its complete suggestions to deal with the problems and issues involved which have been recapitulated above. This order reads as under:

“Further arguments heard in these matters. Arguments have not been concluded.

B We are of the opinion that Union of India/Ministry of Environment should come out with its concrete suggestions to deal with problems and issues which are involved in these petitions and what short term measures can be adopted to tackle the pollution problem which occurs due to firecrackers during
C Diwali. Such affidavit shall be filed by or before next date of hearing.

List on 21.8.2018.”

41. Pursuant to the aforesaid direction, respondent No.1 has filed its affidavit on August 21, 2018. This affidavit states that the Ministry consulted : (i) The Council of Scientific & Industrial Research (CSIR) -
D National Environment Engineering Research Institute (NEERI), (ii) PESO, and (iii) CPCB regarding concrete solutions and short-term measures to be adopted to tackle the pollution problem which occurs due to firecrackers during *Diwali*. Suggestions are received from the
E aforesaid bodies which are annexed as Annexures R-1, R-2 and R-3 respectively. Based on those suggestions, the Ministry has given the following short-term measures/actions which it proposes to tackle the pollution problem due to firecrackers during forthcoming *Diwali* in November 2018:

F “I. To address issue of high contents of unburnt material or partially combusted material due to usage of poor quality of raw material, Raw Material Characterisation Facilities shall be established to maintain quality of the raw materials in gun powder and flash powder as per specifications of PESO. Testing of raw materials shall be initiated at CSIR - Kaliswari
G Joint Facility or PESO or any of the other manufacturer with requisite facilities.

II. Use of Reduced Emission firecrackers (Improved crackers) -
(a) Avoidance of use of ash as desiccant or filler materials in

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- crackers for reduction in particulate mater by 15-20%. These can be implemented subject to approval by PESO, and (b) usage of charcoal meeting specifications of explosives and pyrotechnics as prescribed by PESO. A
- III. Use of Reduced Emission firecrackers (Green crackers: Safe water and air sprinklers (SWAS) - Low emission sound and light emitting functional crackers with PM reduction by 30-35% and significant reduction in NO_x and SO₂ due to in-situ water generation as dust suppressant and low cost due to usage of low cost oxidants. These can be implemented subject to approval by PESO. B
- IV. PESO will ensure fireworks with permitted chemicals only to be purchased/possessed/sold/used during Diwali and shall test and check for the presence of banned chemicals like lithium/arsenic/antimony/lead/ mercury. PESO will ensure suspension of the licenses of manufacturers of such fireworks items and appropriate disposal of such stock. C
- V. PESO will ensure that only those crackers whose decibel (sound) level are within the limits are allowed in the market and will ensure to take action by suspending the licenses of the manufacturers on such violations and disposal of such lots. D
- VI. Diwali data of 2017 shows that average PM_{2.5} was 604 ug/m³, whereas, Aluminum and Barium in PM_{2.5} were 159 ug/m³ (about 4 times of AAQCVs) wand 35 ug/m³ (about 9 times of AAQCVs) respectively. Iron was well within the prescribed limits. Aluminum is used as fuel in fireworks in and to give white brilliant sparkle. Ba is added to give only attractive green colour which is not essential for pyrotechnics. Aluminum may cause dermatitis and having bio-accumulation potential in case of long exposure. Ba salts emit poisonous gas causing respiratory problem in short-term exposure too and may have other health complications in long-term exposure. Therefore, as immediate measure, baning of Barium salts in fireworks may be considered. PESO may be asked to review the chemical composition of fireworks, particularly reducing Aluminum content. E

- A VII. CPCB and respective State Pollution Control Boards/
Pollution Control Committees (SPCBs/PCCs) of the States
and Union Territories shall carry out short-term monitoring in
their cities for 14 days (commencing from 7 days prior to
Diwali and ending 7 days after Diwali) for the parameters
namely, Aluminum, Barium, Iron apart from the regulatory
parameters against the short-term Ambient Air Quality
Criteria Values (AAQCVs) proposed by CPCB with regard
to bursting of firecrackers. This will help in generation of
data on pollution caused by the bursting of firecrackers and
would be helpful for regulation and control quantity of
Aluminum, Barium and Iron used in the manufacture of
firecrackers.
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- VIII. The manufacture, sale and use of joined firecrackers (series
crackers or laris) may be banned as the same causes huge
air, noise and solid waste problems.
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- IX. Major Indian cities may explore the option of community
firecracking with strict time restriction as adopted in some
countries. Other restriction that can be explored include -
bursting of firecrackers may be allowed only in the areas/
fields pre-identified and pre-designated by respective State
Governments.
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- X. Extensive public awareness campaigns shall be taken up by the
Central Government/State Governments/ Schools/Colleges in-
forming the public about the harmful effects of firecrackers.”
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42. We are of the opinion that the aforesaid suggestions strive a
nice balance between the two competing interests. We accept the
aforesaid measures as suggested by the Union of India and direct the
Union of India and other concerned authorities to implement the same
with immediate effect. In view thereof, following specific directions are
issued:
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- (i) The crackers with reduced emission (improved crackers) and
green crackers, as mentioned in Suggestion Nos. II and III above
only would be permitted to be manufactured and sold.
- (ii) As a consequence, production and sale of crackers other than
those mentioned in Suggestion Nos. II and III is hereby banned.
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- (iii) The manufacture, sale and use of joined firecrackers (series crackers or laris) is hereby banned as the same causes huge air, noise and solid waste problems. A
- (iv) The sale shall only be through licensed traders and it shall be ensured that these licensed traders are selling those firecrackers which are permitted by this order. B
- (v) No e-commerce websites, including Flipkart, Amazon etc., shall accept any online orders and effect online sales. Any such e-commerce companies found selling crackers online will be hauled up for contempt of court and the Court may also pass, in that eventuality, orders of monetary penalties as well. C
- (vi) Barium salts in the fireworks is also hereby banned.
- (vii) PESO is directed to review the chemical composition of fireworks, particularly reducing Aluminum content, and shall submit its report in respect thereof within a period of two weeks from today. For undertaking this exercise, PESO would also associate FRDC. D
- (viii) Even those crackers which have already been produced and they do not fulfill the conditions mentioned in Suggestion Nos. II and III above will not be allowed to be sold in Delhi and NCR. E
- (ix) PESO will ensure fireworks with permitted chemicals only to be purchased/possessed/sold/used during *Diwali* and all other religious festivals, of any religion whatsoever, and other occasions like marriages, etc. It shall test and check for the presence of banned chemicals like Lithium/Arsenic/ Antimony/Lead/ Mercury. F
- (x) PESO will ensure suspension of the licenses of manufacturers of such fireworks items and appropriate disposal of such stock.
- (xi) PESO will ensure that only those crackers whose decibel (sound) level are within the limits are allowed in the market and will ensure to take action by suspending the licenses of the manufacturers on such violations and disposal of such lots. To add to it, as mentioned in the order dated September 12, 2017, the directions issued and restrictions imposed in the order passed G

- A by this Court on July 18, 2005 in *Noise Pollution (V)* shall continue to be in force.
- (xii) Direction Nos. 4 to 9 and 11 contained in the order dated September 12, 2017 shall continue to operate and are reiterated again.
- B (xiii) Extensive public awareness campaigns shall be taken up by the Central Government/State Governments/Schools/ Colleges informing the public about the harmful effects of firecrackers.
- (xiv) On *Diwali* days or on any other festivals like *Gurpurab* etc., when such fireworks generally take place, it would strictly be from 8:00 p.m. till 10:00 p.m. only. On Christmas eve and New Year eve, when such fireworks start around midnight, i.e. 12:00 a.m., it would be from 11:55 p.m. till 12:30 a.m. only.
- C (xv) The Union of India, Government of NCT of Delhi and the State Governments of the NCR would permit community firecracking only (for *Diwali* and other festivals etc. as mentioned above), wherever it can be done. For this purpose, particular area/fields would be pre-identified and pre-designated by the concerned authorities. This exercise shall be completed within a period of one week from today so that the public at large is informed about the designated places one week before *Diwali*. The areas designated now for the purpose of *Diwali* shall be valid for community firecracking on other occasions/ festivals as well, as mentioned above. Even for marriages and other occasions, sale of improved crackers and green crackers is only permitted.
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- F Insofar as other States are concerned, an endeavour shall be made by them also to explore the feasibility of community firecracking. However, it is made clear that Direction No. (xiv) pertaining to the duration within which fireworks can take place on all such occasions would be applicable throughout India. Similarly, Direction No. (xiii) for extensive public awareness campaigns is also a pan India direction.
- G (xvi) All the official respondents, and particularly the Police, shall ensure that fireworks take place only during the designated
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time and at designated places, as mentioned above. They shall also ensure that there is no sale of banned firecrackers. In case any violation is found, the Station House Officer (SHO) of the concerned Police Station of the area shall be held personally liable for such violation and this would amount to committing contempt of the Court, for which such SHO(s) would be proceeded against.

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(xvii) CPCB and respective State Pollution Control Boards/ Pollution Control Committees (SPCBs/PCCs) of the States and Union Territories shall carry out short-term monitoring in their cities for 14 days (commencing from 7 days prior to Diwali and ending 7 days after Diwali) for the parameters namely, Aluminum, Barium, Iron apart from the regulatory parameters against the short-term Ambient Air Quality Criteria Values (AAQCVs) proposed by CPCB with regard to bursting of firecrackers. This will help in generation of data on pollution caused by the bursting of firecrackers and would be helpful for regulation and control quantity of Aluminum, Barium and Iron used in the manufacture of firecrackers.

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43. One clarification needs to be given at this stage. Our discussion pertaining to the arguments based on Article 19(1)(g), Article 25 as well as the argument of loss of substantial revenue and unemployment, in cases the manufacture and sale of the firecrackers is totally banned, is *prima facie* and we have not given our conclusive determination. It is because of want of detailed studies on various aspects which have been mentioned and taken note of during discussion in this order. However, we also make it clear that, *prima facie*, we do not find much merit in these arguments for which we have given our reasons in brief.

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44. Having regard to the overall circumstances, we have decided that, for the time being, a balanced approach to tackle this problem is needed, which may take care of the concerns of both the parties and, at the same time, provide a reasonable and adequate solution. When the picture would become clearer after the requisite studies/research is undertaken, more stringent measures can be adopted in future if the situation so warrants.

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A 45. All the interlocutory applications seeking impleadment, intervention, directions, modification, etc. are disposed of in the aforesaid terms.

 46. The writ petitions be listed on December 11, 2018.

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Divya Pandey

Directions issued.